AFOSS.0106

APPLICATION FOR
UNITED STATES LETTERS PATENT

FOR

WEARABLE PHONE AND WRISTWATCH HAVING A DETACHABLE PHONE MODULE AND A SEPARATE PHONE CARRIAGE

BY:

DONALD R. BREWER

Certificate under 37 C.F.R. §1.10 of Mailing by "Express Mail"

EV322434143 US
"Express Mail" label number

July 3, 2003
Date of Deposit

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Jennifer Maner
Signature of person mailing correspondence

Jennifer Maner
Typed or printed name of person mailing correspondence

WEARABLE PHONE AND WRISTWATCH HAVING A DETACHABLE PHONE MODULE AND A SEPARATE PHONE CARRIAGE

BACKGROUND OF THE INVENTION

1. Cross-Reference to Related Application:

This application claims the benefit of and priority to a U.S. Provisional Patent Application No. 60/394,584 filed July 9, 2002, the technical disclosure of which is hereby incorporated herein by reference.

2. Technical Field:

The present invention relates to a wearable phone and wristwatch wherein the wearable phone can be connected to a separate phone carriage that provides additional functionality. The wearable phone includes a phone module with basic functionality.

3. Background to the Invention

Wristwatches are popular for both aesthetic and functional purposes. It is not uncommon for an individual to wear a wristwatch and also to carry a cellular phone. Yet, in many circumstances, a cellular phone is unwieldy. For example, when exercising, a user may find it cumbersome to carry a cell phone. A variety of proposals have previously been made to improve the portability of cell phones. One solution has been to make cell phones particularly small. **FIG. 1*a*** is a popular cell phone that is small enough to place into a shirt pocket. The phone **10** has a numeric keypad **12**, a SEND **14** and END **15** keys, a display **16** and a speaker **18**. A user enters the phone number to be called with the keypad **12**, and presses the SEND **14** button. The user listens with the speaker **18** and presses END **15** to finish the call. Of course, the user must hold the phone **10** during the call or to view information on the display **16**.

Others have attempted to converge the functionality of a cell phone with a personal digital assistant (PDA). For example, the VisorPhone™ by Handspring™ is a hand held computer, or personal data assistant that has a plug-in unit that simulates cell phone capability. The plug in unit is a dual band world phone and a wireless modem, allowing cell phone functionality and wireless Internet access. Software running on the VisorPhone™ controls the phone/internet use. The device also allows short text

messages. The device generally combines a PDA with a cell phone module, which plugs into a top port of the PDA. Of course, the user again must hold the VisorPhone™. The PDA also has a clock function that displays the time.

A number of prior proposals have sought to combine or incorporate a cell phone into a wristwatch device. For example, U.S. Patent No. 6,035,035 to Firooz, entitled "Wrist Mounted Telephone Device," discloses an oval shaped wearable phone that fits around a user's wrist. **FIG. 1*b*** shows one embodiment of the Firooz '035 wearable phone **20**. To use the phone **20**, a speaker element **22** telescopes outward from the phone. The user then turns her wrist **24** so that the speaker **22** is near her ear. The phone **20** is hinged **26** and can be opened and removed from the user's wrist. In either case, the Firooz '035 phone is ungainly in its operation. While a watch unit can be mounted on the opposite side of the oval shaped frame, by placing the phone controls and the watch on opposite sides of the oval shaped band, the user is inconvenienced when wanting to view the time.

U.S. Patent No. 6,192,253 to Charlier et al., entitled "Wrist-Carried Radiotelephone," also discloses a wristwatch having a cell phone incorporated therein. As shown in **FIG. 1*c***, the Charlier et al. '253 watch **30** has a first housing **32** that includes a microphone **34**, a display **33** and a circuitry of a radio transceiver. The display **33** is adapted to show the time and date. A second housing **36** includes a latch **35** and a speaker **38**. In use, when a user receives a call, he uncouples the latch **35** and straightens the strap. He can then hold the speaker **38** near his ear and the microphone **34** near his mouth. The user is limited to the functionality that can be placed on either the first or second housings **32**, **36**. Also, in use, the entire Charlier et al. '253 device must be removed from the user's wrist.

U.S. Patent No. 5,274,613 to Saeger, entitled "Wristwatch Radiotelephone," discloses a combined wristwatch and radiotelephone, which is suitable in one configuration for wearing on the wrist as a wristwatch, and in another configuration for use as a hand-held radiotelephone. As shown in **FIGS. 1*d*** and **1*e***, the wristwatch radiotelephone of the Saeger '613 patent includes an annular wristband portion **50** and a timekeeping and radiotelephone portion **40** removably mounted on one side of the wristband portion. The wristband portion **50** includes an arrowhead snap **56** on one side for removably securing timekeeping and radiotelephone portion **40** to the wristband. The

arrowhead snap **56** fits into a mating recess (not shown) in the underside of portion **40**. This structure holds portion **40** securely to portion **50** but allows the user to pull portion **40** off portion **50** whenever desired. However, when it is desired to use the Saeger '613 apparatus as a radiotelephone, portion **40** must be removed from wristband portion **50** by pulling portion **40** off arrowhead snap **56**. The user then pivots each of end members **42** and **46** out from member **45** approximately 180° as shown. Thus, the Saeger '613 device only allows portion **40** to be attached in one configuration to wristband portion **50**. Moreover the Saeger '613 device does not allow a user to answer or make telephone calls with the radiotelephone portion **40** connected to the wristband portion **50**. While perhaps improving the portability of the incorporated radiotelephone, the Saeger '613 device still requires that the radiotelephone be operated in a conventional hand-held manner.

Prior proposals also include U.S. Patent No. 5,008,864 to Yoshitake, entitled "Portable Radio Telephone Device." As shown in **FIG. 1*f***, the Yoshitake '864 patent discloses a portable radiotelephone device **60** in which a radio device body **62** is mounted in the form of a wristwatch on an arm by means of a carrying strap **64**. The Yoshitake '864 patent highlights a problem inherent in incorporating radiotelephone technology into a wrist worn devices. As instrumentation is miniaturized and adapted for incorporation into a wrist worn device, the antenna comprises a more significant portion of the device. According to the Yoshitake '864 patent, it is extremely difficult to incorporate an antenna into the main body **62** in view of the required antenna efficiency, the mixing-up of receiving and transmission, miniaturization, productivity and the like. To overcome this problem, the Yoshitake '864 device discloses the incorporation of an antenna **66** embedded into the wristband carrying strap **64**. Similarly, a voice transmission tube 68 is also incorporated into the wristband carrying strap **64** to separate, both acoustically and electrically, the sending speech function from the receiving function. However, the radio device body **62** the Yoshitake '864 device, while detachable from the wristband carrying strap **64**, is not operable when detached.

Another prior proposal is U.S. Patent No. 6,212,414 to Alameh et al., entitled "Wrist-Carried Radiotelephone," which discloses a wrist-carried radiotelephone, which is operable without removing from a user's wrist. As shown in **FIGS. 1*g*** and **1*h***, wrist-carried radiotelephone **70** includes a housing **72** having a display and a battery **73**, and a

wristband **76** having a plurality of rigid and flexing portions. A plurality of segmented printed circuit boards **74** are disposed within a hollow portion of a curved section of a wristband **76**. The printed circuit (PC) boards **74** of the Alameh et al. '414 device carry radiotelephone circuitry excluding the antenna and user interface circuits such as a display, and a battery **73**. The PC boards **74** of the Alameh et al. '414 device can be rigid or flexible, and can be straight or curved. Preferably, the PC boards **74** are semi-flexible, and are substantially straight segments, as manufactured. The PC boards **74** are interconnected with wires to provide complete radiotelephone operation. Preferably, the wire interconnects are flex circuits as are known in the art. Moreover, the Alameh et al. '414 discloses no less than six antenna configurations usable in accordance with the invention. While the delineated configurations can be stationary, or movable to provide increased efficiency, all are embedded or incorporated to some degree into the wristband **76** of the invention. The housing **72** of the Alameh et al. '414 device also discloses a hinged display 72a which facilitates the removal of at least one battery 73 while the user is wearing the wristband 76. According to the Alameh et al. '414 patent, "convenient battery changing is important in wrist-worn cell phone devices as the batteries are much smaller than those available in standard cellular phones, and will need to be changed more often, even with the advent of exotic material technologies providing more powerful batteries, such as a lithium cell, for example. It is expected that a battery-housing configuration as described above can provide enough capacity (using a 23 × 23 × 6 mm Li-Polymer cell, for example) to power the radiotelephone circuitry for about one hour of conversation during a telephone call and for about twenty hours in a standby mode waiting to receive a call."

While an ever-evolving diversity of digital wireless cell phone technology is available for adaptation into wrist-worn devices, adapting conventional cell phone and battery technology into devices suitable for use as wrist-worn devices inherently creates additional problems. Two of the most promising technologies currently available are Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA). GSM is a digital cellular system found in almost all of Europe, parts of Asia, and parts of North America. Although designed as a European standard, due to its flexibility and excellent implementation of Time Division Multiple Access (TDMA)

technology, GSM has grown into a truly worldwide standard. GSM uses General Packet Radio System (GPRS) technology to accommodate high-bandwidth data traffic. GPRS will handle rates from 14.4 Kbps using just one TDMA slot, and up to 115 Kbps and higher using all eight slots. It will also permit users to receive voice calls simultaneously when sending and receiving data. GSM also allows mobile terminals with different maximum output powers. The maximum power of the mobile determines its power class. Most of the mobiles are either 2W class 4 (900 MHz) or 1W class 1 for the 1900/1800 MHz operation.

Code Division Multiple Access (CDMA) is a digital cellular system used mainly in the United States and South Korea. CDMA is a spread spectrum modulation technology whereby channels defined by means of mathematical codes are able to share the same frequency band simultaneously (IS95 A/B, IS2000 1X-3X). Originally developed by Qualcomm®, CDMA uses more advanced encoding and spread spectrum technology to produce higher voice clarity and spectral efficiency than GSM. Additionally, CDMA handsets generally use low amounts of power. Recently, CDMA (IS-95) in the US has been upgraded to IS2000–1XRTT (1st Generation Radio Transmit Technology of 3G) which can accommodate data rates as high as 144Kbps. The 3× version will purportedly accommodate up to 1 Mbps. At the moment, CDMA technology networks are positioned with a much clearer and efficient path to 3G systems than GSM. In the United States, CDMA technology is the dominant player whereas GSM technology is the dominant player for the rest of the world.

With reference to **Fig. 1*i***, a block diagram of the typical components of a conventional digital mobile phone is shown. The typical digital mobile phone may be conceptualized as three fundamental components: a transmission component, a reception component, and an auxiliary component. As depicted in **Fig. 1*i***,, the transmission component includes a microphone **80**, connected to audio processing technology, which is further connected to channel encoding, interleaving and message generation functionality **82**, which in turn connects to a ciphering means **83** and RF processing **84** prior to being transmitted via antenna **85**. The reception component includes the same antenna **85** where a received message is in turn processed via RF processing **94** and de-ciphering means **83**, which conveys the received message to a channel de-encoding, de-

interleaving, and message regeneration functionality **92**, whereupon it proceeds through audio processing **91** to produce a sound in speaker **90**. The auxiliary component **96** includes a keypad, display, battery and other assorted auxiliary functionality.

Mobile phone units utilizing GSM technology further include a Subscriber Identity Module (SIM) **86** that stores a subscriber's unique identification information. The SIM **86** is typically a removable part of the mobile phone unit, thus, allowing the subscriber to access the network regardless of the particular mobile phone unit being used. The billing information is recorded on the card and when the user comes back to their home network, all billing information is uploaded. Development of the SIM **86** was driven by the early deployment of GSM networks since it provides roaming capability, even between the networks that are not connected through physical signaling lines. This kind of roaming, known as "SIM roaming," allows roaming services between providers with disjoint wireless networks.

Regardless of the technology format used, it is difficult to add the important functionality of a cell phone to a wrist-worn device while not impairing the usefulness and ergonomics of the watch. Adapting conventional cell phone and battery technology into devices suitable for use as wrist-worn devices create additional problems. A need, therefore, exists for a more flexible unit that provides reasonable battery life to the phone and watch. Further, a need exists for an improved wrist-worn phone that allows the user to have the device act primarily as a watch until a phone call is sent or received. A need also exists for a wrist-worn phone that is more flexible and easier to use. For example, it would be advantageous for a user to utilize a wrist-worn phone which is operable not only when attached to the user's wrist, but is also when separately removed from the user's wristband. Further, it would be advantageous if the functionality and battery life of a wrist-worn unit could be enhanced and extended when attached to a separate phone carriage. Moreover, it would be advantageous to fashion a wrist-worn phone as a watch with standard analog movement. Additionally, it would be advantageous to configure the speaker and microphone elements of a wrist-worn phone to be either water-resistant or waterproof. Finally, it would be beneficial if the problems associated with antenna placement and battery life inherent in the adaptation of cell phone technology to wrist-worn devices could be ameliorated.

SUMMARY OF THE INVENTION

The present invention overcomes many of the disadvantages of prior art wrist-worn phone devices. The present invention includes a wristphone, comprised of a phone module and an interlocking watch module, that can be inserted into a supporting watchband style receiver, or removed and configured to be inserted into a conventional cell phone style carriage. Both the wristphone and the cell phone style carriage can include discrete speaker and microphone components, allowing smaller components to be used in the wristphone configuration. Other features and functionalities may also be separated from the core phone module such as a numeric keypad with varying styling options, a supplementary battery, an improved antennae, an IrDA interface, Bluetooth radio, MP3 player, or digital camera.

In accordance with another feature of the invention, the phone module and the watch module have complementary surfaces that allows the two to snap together. Likewise, the assembled wristphone can be snapped into a receiver unit on a wristband, such that either the watch or the phone module can be visible to the user. When a call arrives, the wristphone can be removed from the receiver unit and the call answered. When the call is complete, the wristphone can be re-coupled to the receiver unit. Alternatively, the wristphone can also be operated while still attached to the receiver unit on the wristband. This provides the user with a simple way to have both a watch and a phone without the need for two separate components. Thus, when the user is exercising or needs both hands free, he can still stay in touch with his phone.

In accordance with another feature of the invention, the phone module of the wristphone may also be configured with a carriage unit. The carriage unit has a surface complementary to that of the phone module such that in this configuration, the phone module and carriage unit may be snapped together to form a conventionally styled cell phone. The carriage unit may also comprise components which expand the battery life and the functionality of the phone module.

In accordance with still another feature of the invention, the entire wristphone may also be configured with an alternate carriage unit. The alternate carriage unit includes means for grasping and coupling the entire wristphone so as to form in combination an alternate embodiment of a conventionally styled cell phone. The carriage

unit may also comprise components which extend the battery life and the functionality of the wristphone.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the method and apparatus of the present invention may be had by reference to the following detailed description when taken in conjunction with the accompanying drawings, wherein:

FIGS. 1*a*, 1*b*, 1*c*, 1*d*, 1*e*, 1*f*, 1*g* and **1*h*** are assorted views of a prior art phone technology;

FIG. 1*i*, is a block diagram of the essential components to a conventional GSM digital mobile phone;

FIG. 2*a* is a perspective in exploded view of the phone module and watch module in an embodiment of the wristphone of the present invention;

FIG. 2*b* is a perspective in engaged view of the phone module and watch module in an embodiment of the wristphone of the present invention;

FIG. 2*c* is an exploded schematic cross sectional side view of an embodiment of the wristphone of the present invention;

FIG. 2*d* is an engaged schematic cross sectional side view of an embodiment of the wristphone of the present invention;

FIG. 2*e* is an schematic cross sectional view of the top side of the phone module of the wristphone of the present invention;

FIG.2*f* is an exploded perspective view of an embodiment of the watch module of the present invention;

FIG. 3*a* is a top view of an embodiment of the phone module engaged in the wristphone of the present invention;

FIG. 3*b* is a side view of an embodiment of the phone module of the present invention illustrating a toggle control that can be used to manipulate the phone module functions;

FIG. 3*c* is a top view of an alternate embodiment of the phone module of the present invention;

FIGS. 4*a*, 4*b* and **4*c*** are perspective views of assorted embodiments of the wrist receiver unit of the present invention;

FIG. 5*a* is a perspective in exploded view of an embodiment of the present invention illustrating how the wristphone engages a wrist receiver unit;

FIG. 5*b* is a perspective view of an embodiment of the present invention illustrating the wristphone engaged in the wrist receiver unit and configured with the watch module facing up;

FIG. 5*c* is a perspective view of an embodiment of the present invention illustrating the wristphone engaged in the wrist receiver unit and configured with the phone module facing up;

FIG. 5*d* is a side view of an embodiment of the present invention illustrating the wristphone engaged in the wrist receiver unit and configured with the phone module facing up;

FIG. 5*e* is a side view of another embodiment of the present invention illustrating the alternate embodiment of the wristphone engaged in the wrist receiver unit and configured with the watch module facing up;

FIG. 6*a* is a perspective in exploded view of an embodiment of the phone module of the present invention illustrating how the phone module engages a carriage unit;

FIG. 6*b* is a perspective view of an embodiment of the phone module of the present invention illustrating the phone module engaged in the carriage unit,

FIG. 7*a* is a frontal exploded view of an alternate embodiment of the wristphone of the present invention illustrating how the wristphone engages an alternate carriage unit;

FIG. 7*b* is a frontal view of an alternate embodiment of the wristphone of the present invention illustrating a first view of the wristphone engaged in the alternate carriage unit; and

FIG. 7*c* is a frontal view of an alternate embodiment of the wristphone of the present invention illustrating a reverse or second view of the wristphone engaged in the alternate carriage unit.

Where used in the various figures of the drawing, the same numerals designate the same or similar parts. Furthermore, when the terms "top," "bottom," "first," "second," "upper," "lower," "height," "width," "length," "end," "side," "horizontal," "vertical," and similar terms are used herein, it should be understood that these terms have reference only to the structure shown in the drawing and are utilized only to facilitate describing the invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to **FIGS. 2*a*** and **2*b***, a perspective view of an embodiment of the wristphone **300** of the present invention is shown. The wristphone **300** is comprised of a phone module **100** and an interlocking watch module **200**. The phone module **100** includes a display **104**, a ringer to announce an incoming call (not shown), a speaker **106** and controls **108** to answer and end a call. As shown in the cross-sectional views depicted in **FIGS. 2*c***, **2*d***, and ***2e***, the phone module **100** may also include within its housing **102** an internal antenna **110**, a printed circuit board card (PCB) **112**, a module **114**, and a SIM connector **116**. The internal antenna **110** is positioned a sufficient distance away from any circuitry underneath the antenna **110** to preclude interference. The housing above the RF portion of the PCB **112** is shielded and grounded. Additionally, the receiver circuit has a metal enclosure. The phone module **100** provides very basic functionality for the user. For example, in the embodiment shown, the phone module **100** does not have a keypad for alphanumeric entry. However, the phone module **100** may include a memory for storing phone numbers. In the embodiment shown to **FIG. 2*b***, two separate buttons **118a**, **118b** are provided for scrolling through names in a memory list.

The watch module **200** comprises a housing **202** which includes complementary surfaces **210**, **212** that conforms to and couple with a matching surface on the phone module **100**. The watch module **200** further includes within its housing **202** an enclosed battery **208**, a clock, and a microphone **220**. The battery **208** may be comprised of a conventional lithium-ion cell or a custom formed lithium polymer cell. When the phone module **100** and watch module **200** are snapped together, they collectively form a wristphone **300**. When the phone module **100** and watch module **200** are properly conjoined, the battery **208** connects with the phone module **100** to power the phone module **100**.

FIG. 2*f* provides an exploded perspective view of an embodiment of the watch module **200** of the present invention. In the embodiment shown, the module **200** includes a removable face cover **230** that snaps onto the module **200**. The face cover **230** has a transparent portion that allows the user to see the display of a clock component **232**. The display of clock component **232** can be an analog dial as shown or a digital display. An

auxiliary battery **236** may be placed under the clock component **232** to provide power. A winder **234** may also be used to adjust the time or date displayed on the display of clock component **232**.

Referring now to **FIG. 3*a***, which illustrates a top view of the face of an embodiment of the phone module **100** engaged in the wristphone **300** of the present invention, while the embodiment illustrated includes two separate buttons **118a**, **118b** for scrolling through names in a memory list, **FIG. 3*b*** shows an alternate embodiment wherein a rocker switch **190** is used. The rocker switch **190** can be located on the side of the phone module **100**. A user can scroll through a list using controls **192**, **194**.

FIG. 3*c* shows a top view of the face of an alternate embodiment of the phone module **100a** engaged in the wristphone **300** of the present invention. While the originally illustrated embodiment of phone module **100** provides only basic functionality to the user, the alternate embodiment of the phone module **100a** illustrated in **FIG. 3*c***, may provide the full functionality of a conventional keypad using a novel methodology in the modes, functionality, and sequencing of its controls buttons. Phone module **100a** includes a display **104a**, a multi-positioned toggle switch **108a**, an enter/call button **120**, a end/exit button **122**, a menu selection button **124**, and a directory button **126**.

With reference now to **FIG. 4*a***, an embodiment of the wrist receiver unit **400** of the present invention is shown which is incorporated onto a conventional watchband **402**. The conventional watchband **402** may further comprise a mechanism or device for attaching and adjusting **404** (*e.g.*, a prong buckle) to a user's wrist. The wrist receiver unit **400** includes a base **408** and two opposing biased clips **404**, **406** which securely grasp the wristphone **300**. The portions of the wrist receiver unit **400** surrounding clips **404**, **406** are provided with surfaces complementary to the matching surfaces on the wristphone **300** to ensure a tight and snug fit. The clips **404**, **406** may also include portions which project into recesses in the wristphone **300**.

FIGS. 4*b* and **4*c*** illustrate alternate embodiments of the wrist receiver unit **400a**, **400b** which may further include a convexity **408*a*** and/or concavity **410** to protect and/or interlock with one or both sides of the wristphone **300**. In particular, convexity **408*a*** and/or concavity **410** may also include sealing means for certain components of the wristphone **300** (*e.g.*, case opening for microphone and speaker) thereby improving the

water resistance of the components. The sealing means may include gaskets adapted to the wrist receiver unit **400a** or manufacturing all or part of the wrist receiver unit **400a** using flexible materials capable of conforming its shape to that of the wristphone so as to provide a water resistant or waterproof seal.

Referring now to **FIGS. 5*a***, **5*b***, and **5*c***, perspective views of an embodiment of the present invention are shown illustrating how the wristphone **300** engages a wrist receiver unit **400a**. As shown in **FIG. 5*b***, the wristphone **300** may be configured in the wrist receiver unit **400a** with the watch module **200** facing up. Alternatively, the wristphone **300** may be configured in the wrist receiver unit **400a** with the digital display of the phone module **100** facing up, as shown in **FIG. 5*c***. In either configuration, clips **404**, **406** securely grasp the wristphone **300** as illustrated in **FIG. 5*d***. Moreover, as shown in the alternate embodiment of the present invention illustrated in **FIG. 5*e***, clips **404**, **406a** may also include portions which project into and securely engage recesses in the wristphone **300a**.

The wristphone **300** may also be coupled to a more traditional phone carriage unit thereby enhancing the utility and flexibility of the present invention. For example, in one embodiment of the present invention, the phone module **100** may be coupled to a more traditional phone carriage unit **500** as shown in **FIG. 6*a*** and **6*b***. The phone module **100** has a surface that complements the carriage surface **502** allowing them to be securely coupled to form in combination a cell phone **600**. The carriage unit **500** may provide additional functionality, such as a full keypad **504**, enhanced speaker **508**, IrDA interface (not shown), digital camera (not shown), MP3 player (not shown), charging/power jack (not shown), and a data communication port (not shown). The carriage unit **500** can also provide for an improved microphone **506** and headphone jack (not shown). Moreover, due to its size, the carriage unit **500** can hold a separate and/or additional longer-lasting battery. As with the battery **208** in the watch module **200**, the battery contained in the carriage unit **500** may also be a conventional lithium-ion cell or a custom formed lithium polymer cell. The carriage unit **500** can also act as the primary means whereby the battery **208** in the watch module **200** may be recharged. Additionally, charging/power jack may be used in a conventional manner to provide power directly to cell phone **600**

either while recharging the battery contained within the carriage unit **500** or battery **208** or in the absence of any installed batteries.

Alternatively, in a preferred embodiment of the present invention, the entire wristphone **300a** may be coupled to an alternate phone carriage unit **500a** as shown in **FIGS. 7*a*** , **7*b*** and **7*c***. In addition to the added functionality of the first embodiment of the carriage unit **500**, the alternate phone carriage unit **500a** also includes means for coupling the entire wristphone **300a** so as to form in combination an alternate embodiment of the cell phone **600a**. As illustrated in **FIG. 7*a***, in one embodiment the means for coupling may include opposing prongs **510**, **512** for securely grasping the sides of the wristphone **300a**. The means for coupling may further include guiding surfaces **516** to properly align the wristphone **300a** between the opposing prongs **510**, **512**, and locking pins **514** to securely couple the wristphone **300a** and the alternate phone carriage unit **500a**. Whereas the first embodiment of the cell phone **600** displays only the face of the phone module **100** (see **FIG. 6*b***), the alternate and preferred embodiment of the cell phone **600a** is capable of simultaneously displaying both the face of the phone module **100a** in one view (see **FIG. 7*b***) and the face of the watch module **200a** (see **FIG. 7*c***) in another view. Moreover, the preferred embodiment of the cell phone **600a** is also capable of using the integral battery of wristphone **300a** as a source of power.

Thus, the device of the present invention may be employed in two basic modes: a wrist-worn mode and a conventional cell phone mode. As shown in **FIGS. 5*b*** and **5*c***, in the wrist-worn mode, the wristphone **300** is engaged in a wrist receiver unit **400** and configured with either the watch module **200** or the phone module **100** facing up. When a call arrives, the user may be alerted with either a tone or a light. In one embodiment, the tone may be a traditional ringing sound, and the light may be a flashing LED or LCD or bioluminescent. In another embodiment, the wristphone **300** may have a vibrator that alerts the user to an incoming call. The user may answer the call pushing the appropriate button on the phone module **100** and then either leaving the wristphone **300** in the wrist receiver unit **400** or detaching the wristphone **300** from the clips **404**, **406** in the wrist receiver unit **400**. In one embodiment, the act of detaching the wristphone **300** from wrist receiver unit **400** may initiate the answering of the call. If equipped with a caller ID functionality, the identity of the caller may be shown on the display **104**. When the call is

complete, the user can simply press the appropriate button to end the call. If previously removed, the wristphone **300** can then be placed back in to the wrist receiver unit **400** so that either the phone module **100** or the watch module **200** is visible.

Alternatively, to send a call, a user can scroll through a preloaded list of telephone numbers stored in memory, selecting the appropriate number by depressing controls **108** to initiate the call. Selecting and initiating a call can be accomplished with the wristphone **300** either engaged in or disengaged from the wrist receiver unit **400**. Indeed, all of the steps in placing or receiving a call can be accomplished while the wristphone **300** is latched into the wrist receiver unit **400**. The user may simply find it more convenient to remove the wristphone **300**.

The cell phone mode is accomplished in one of two configurations detailed previously. Thus, either a phone module **100** is engaged in a carriage unit **500**, as shown in **FIGS. 6*a*** and **6*b***, or the entire wristphone **300a** is configured in an alternate carriage unit **500a**, as shown in **FIGS. 7*a***, **7*b***, and **7*c***. In either configuration, the functionalities of the wristphone or phone module and its associated carriage unit supplement and complement each other such that the resulting cell phone operates in a manner similar to conventional cell phones. Thus, when a call arrives, the user may be alerted with either a tone or a light. In one embodiment, the tone may be a traditional ringing sound, and the light may be a flashing LED or LCD or bioluminescent. In another embodiment, the cell phone may have a vibrator that alerts the user to an incoming call. The user may answer the call by pushing the appropriate button on the phone module. If equipped with a caller ID functionality, the identity of the caller may be shown on the display. When the call is complete, the user can simply press the appropriate button on the phone module to end the call. To send a call, a user can may use the buttons on full keypad **504** or scroll through a preloaded list of telephone numbers stored in memory in a conventional manner using control buttons on the phone module, selecting the appropriate number by depressing the appropriate control button to initiate the call. Additionally, phone numbers and other data may be entered in the memory of the phone module by means of the keypad **504**, IrDA interface, or the data communication port.

It will now be evident to those skilled in the art that there has been described herein an improved wearable phone and wristwatch device. Although the invention

hereof has been described by way of a preferred embodiment, it will be evident that other adaptations and modifications can be employed without departing from the spirit and scope thereof. For example, the present invention envisions alternate embodiments which may use either GSM or CDMA technology. While the two technologies differ significantly from one another and are incompatible with one another, it is understood that from a conceptual point of view the handsets components of the two technologies are very similar. While the embodiments depicted in many of the various Figures illustrate a GSM version of the present invention, it is understood that either CDMA or GSM technology, or for that matter any suitable cell phone technology format. Thus, the terms and expressions employed herein have been used as terms of description and not of limitation; and thus, there is no intent of excluding equivalents, but on the contrary it is intended to cover any and all equivalents that may be employed without departing from the spirit and scope of the invention.